Sustainable Development: People or Technology?

Gary J. Jones, (gjjones@sandia.gov)

Most discussion of development over the last two decades has included the adjective "sustainable," a word now so closely linked with "development," they are really one buzzword. As with most buzzwords, they have lost much of the original meaning, and this is especially true when "sustainable development" is applied to rural areas in the developing world.

Arguably, the best known definition of sustainability is in a 1987 United Nations Commission report on Environment and Development (Bruntland Commission) entitled, *Our Common Future*. There, sustainable is defined as "…development that meets the needs of the present without compromising the ability of future generations to meet their needs." This definition works well when applied to evolutionary development in the G7 countries where it has been used as a basis for technology development and selection. Unfortunately, it fails when applied to the revolutionary development characteristic of lesser-developed countries where the real issue is people and empowerment, not technology.

The problems in developing countries are staggering. Over 40% of the world's population—2.5 billion people—do not have access to electricity or to the economic, health, and quality-of-life improvements that it brings. Yet all efforts to improve this statistic have barely managed to keep pace with birthrates in the developing world. This is a problem that has ramifications for all of us. We need to understand that these are the most disenfranchised populations—isolated from a central government economically and politically, with below-average health care, education, and communication infrastructures. Their status can impact a country's stability and serve as the breeding ground for political upheaval—whether it is Mexico, the Philippines, or Zimbabwe. For

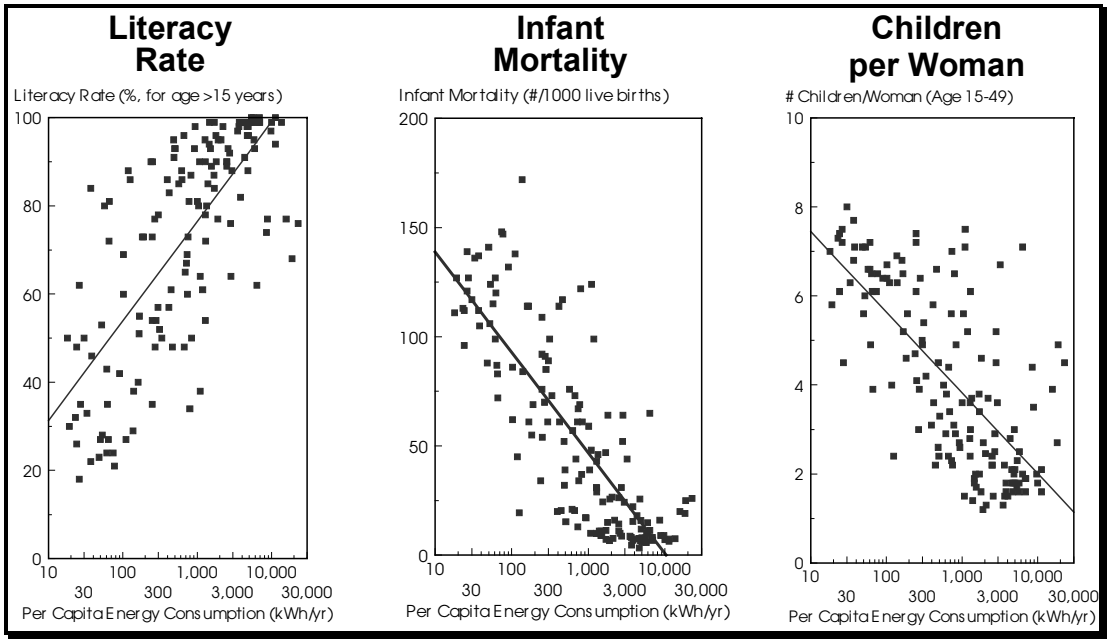

Figure 1: While there is significant scatter, it is obvious that these quality-of-life measures track individual energy availability and consumption, as does per capita gross national product.

these people, rural development is an issue of socio-political necessity; it is the cornerstone of individual and community empowerment. But, as critical as it is, sustainable rural development in the developing world is difficult. *Programs must include not only the deployment of appropriate energy sources, but also the attendant social, economic and political infrastructure development.*

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The majority of these billions of people do not have electricity because they are isolated and disbursed, making the cost of basic utility grid extension prohibitive. Bringing electricity to them requires the use of distributed energy sources such as diesel generators, renewable energy systems, or microhydro installations. However, effective operation of distributed sources requires the involvement of the local population for ownership, installation, operation and maintenance.

Lack of local involvement has led to developmental horror stories on every continent, ranging from diesel systems sitting idle because there was no provision for maintenance or refueling, hydroelectric systems installed without regard for local household interconnection, and non-functioning renewable energy systems with no component replacement or battery maintenance program. Sustainability in these situations is as much a matter of local stakeholder involvement as it is the selection of the best technology option. For these systems to be sustainable there must be trained local maintenance personnel with access to local distributors and suppliers. This, in turn, requires involvement of rural extension services, technical-vocational schools and even the local universities to build the needed educational infrastructure. Assuring local project responsibility suggests that the initial installation involve the local distributors and suppliers who will be called upon to support system operation. Since these electrification options are often technologies new to the region, business development efforts are needed to assure growth of a related local industry.

It is important to remember that electrification and energy supply are merely the tools for development—the real objective is economic empowerment. Therefore, the business development initiative building the local energy industry must also be used to realize the potential for economic development that electrification brings. The initiative should include training in business planning and operation as well as fostering access to credit mechanisms.

In rural communities in the developing world there is little if any familiarity with the concept of consumer credit. If rural development programs are to be successful some microcredit facility must be established. Whether it is structured as the Grameen Bank in Bangladesh, or is a revolving fund established by a non-government development organization, or is a loan program guaranteed by the national development agency, credit with little or no collateral must be made available in the rural communities to allow economic growth. Experience has shown that the establishment of these credit mechanisms can have as great an impact as the electrification itself.

Finance can also contribute to the perception of ownership. Development projects must not be viewed as something done by another (the government, donor aid, etc.), but rather as something the people own. This can mean the difference between a system subject to theft, foul play, or failure, and one that is revered, protected and effective. (This is the reason why in many countries photovoltaic systems owned by the telecommunications company are routinely stolen, while school, clinic, and home systems are respected and protected.) Ownership can be fostered by requiring full or partial repayment for village systems over time—requiring the establishment of a credit mechanism.

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Development involving the introduction of new technologies and concepts into societies always results in stress on those societies—the greater the change, the greater the stress. By focusing on empowering people, it is possible to introduce advanced technologies into these societies without destroying the traditions and cultures that hold the societies together. Sustainability then becomes not a matter of technology choice but rather a matter of infrastructure development. Education and training, credit mechanisms, and business development are the true nexus of effective programs.

The complexity of sustainable development programs should not be used as an excuse for moving slowly—as difficult as they may be, they must be pursued. Without these programs to assure economic and educational empowerment, self-determination, adequate health care, and informed political involvement, we will not break the cycle of poverty in the developing world. The Honorable Mustafa Nyang'anyi, Ambassador of the United Republic of Tanzania to the US, may have said it best at a recent meeting in Baltimore: "We don't need more studies, we need more action. Studies make you feel good but accomplish nothing. We need training programs, financial programs and long-term commitment to development if we are to make progress."